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Ontario

Ministry of Natural Resources

Deer Conservation in Winter

A question of food, fat and habitat

Endorsed by:

Wildlife Winter Feeding Program Inc.

ONTARIO FEDERATION OF ANGLERS & HUNTERS

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Winter is tough on wildlife. Food becomes scarce and is less nutritious than at other times of the year. Snow, wind and cold make conditions more demanding. Survival for wildlife means migration, hibernation or adaptation. White-tailed deer are adaptable and make adjustments to stay active year-round.

In winter, deer move to suitable cover. They move around less and decrease their metabolism and body temperature. This biological "fine-tuning" enables deer to conserve energy and survive our northern winters. Landowners in areas with deer winter range can have a direct influence on deer survival. The effects can be positive or negative.

This bulletin describes the ecology of deer in winter and outlines how you can help deer through conservation projects on your property, and through cooperation with the Ministry of Natural Resources. The material is based on recently improved knowledge of deer habitat, and on field research from MNR's Cooperative Deer Study.

Deer Biology and Energy Conservation

White-tailed deer in Ontario are located along the northern fringe of their continental range. To survive the winter, Ontario deer have altered their habits in a number of ways.

In late summer and fall deer build up fat that will become winter fuel. Acorns and beech nuts -- often referred to as "mast" -- are valuable sources of this fat. Fat reserves can supply almost one third of a deer's winter energy needs.

Deer also develop highly insulated winter coats. Dense inner fur and long, hollow outer hairs create a coat 10 times thicker than the summer coat. Newly-attired, they head for traditional winter ranges known as "deer yards." Ideal wintering areas provide the shelter of conifers close to food supplies.

Deer are able to conserve energy by "yarding up". Conifers such as hemlock, cedar, pine and spruce catch snow on their branches and thus reduce the depth of snow beneath. Deer pack accumulated snow into a network of trails and runways. Trails allow deer to move easily between food and cover, saving valuable energy reserves. Conifers also reduce winds and moderate the temperature. On cold nights temperatures beneath heavy conifer cover can be ten degrees warmer than in open areas. Deer spend many hours lying under the protective boughs of these evergreens.

In winter, deer subsist on buds and twigs of deciduous trees and shrubs such as yellow birch, hazel, dogwood, mountain, striped, red and sugar maple. Cedar and hemlock foliage also provide food. But compared to lush summer vegetation, winter foods are harder to digest and are lower in food value.

Natural winter foods, even when abundant, usually do not prevent a loss of energy and weight. This is normal. In an average Ontario winter, deer can lose up to 25 per cent of their body weight without affecting their survival.

As winter progresses, the survival of deer depends on three primary factors: the amount of stored fat, the availability of natural foods, and the severity of the winter. Added stress or mortality can be caused by predators such as wolves or free-running dogs.

Deer also produce hormones that regulate body activity. You might think deer would "crank up the heat" to stay warm, but the opposite is true. During winter the deer you see may appear normal, but internally they are operating in slow motion. Body temperature is lowered, particularly in the legs and ears. As the quality and quantity of the food declines, body functions such as digestion are also slowed.

Buds and twigs - A winter smorgasbord for deer.

By mid-winter, when weather is most severe, energy demands of deer feeding on natural foods are the lowest of the year. This is like people driving very slowly to conserve a low tank of gas.

Deer begin to snap out of this "walking hibernation" in late winter. Longer days and warmer temperatures stimulate deer to prepare for spring. By green-up their energy needs have been boosted 200 to 300 per cent. At that time, deer feed on fresh green sprouts to restore their body weight. Clovers, grasses and young shoots of wildflowers are prime foods.

The Last Straw - Late Winter and Early Spring Mortality

The end of winter is hardest on deer. Food supplies may be very low, especially if snows forced deer into the yards early in the winter. Snows may restrict deer to already overbrowsed yarding areas. Spring foods may not be available soon enough.

Fawns born the previous spring usually suffer first because most of their energy has been directed to body growth. They have a harder time moving through snow to find food and have little time to build fat reserves in the fall. Adult bucks fare only slightly better. Hectic activity during the fall rutting period burns up fat reserves that would otherwise sustain the bucks in winter.

Despite being pregnant in mid-winter, adult does may be the last to succumb to severe winter conditions. Pregnant females have the lowest activity of all deer, which helps them survive and perpetuate the species. However, after a hard winter, fawns born in the spring may be weak or undersized, and may die soon after birth. This is one of the hidden costs of a severe winter.

"Carrying capacity" is the number of deer an area can sustain without causing long term declines in food supply. When carrying capacity is exceeded deer can become stressed or malnourished from poor food supplies. Reproductive rates decrease. Females may abort unborn fawns. Spring-born fawns may die. Deer may starve. Severe winters reduce carrying capacity by reducing the availability of food. Wildlife managers monitor winter conditions through the use of a winter severity index (see previous page).

WINTER SEVERITY INDEX

If you have ever experienced a raging blizzard, you can probably imagine that temperature is not the only thing affecting survival of deer in winter. Snow and wind conditions also take their toll. MNR monitors several environmental conditions to determine how hard the winter is on deer. These measurements are used to calculate the winter severity index.

In some locations, MNR staff take weekly readings of snow depth, condition of crusts, snow compaction and chill. Gauges resembling pogo sticks measure snow compaction and give an estimate of how far deer would sink in the snow. A high-tech version of a pressure cooker is used to measure winter energy requirements or "chill." This device gives an idea of how a deer's body is affected by cold or wind chill.

MNR staff monitor winter conditions in deer habitat across the province. Photo - P. C. Smith

Several crusts have been penetrated by the"pogo stick" gauge in this carved-away snow drift. Photo- P. C. Smith.

A winter severity index blends the effects of snow depth, sinking depth and chill. A snow depth index can also be used to measure severe winter conditions. Both indices build over the winter and provide an early warning signal about the effects of late winter conditions (good or bad) on deer. MNR staff then consider such factors as the condition of deer when winter arrived, the abundance or scarcity of fall foods, and the length of time the deer have spent in the yards. Wildlife managers relate these factors to the amount of available food and the time until spring before deciding what, if any, conservation action is required such as emergency feeding.

Dogs and Deer

Dogs which are allowed to run at large in deer wintering areas are a big problem for deer in winter. Dogs may chase deer and kill them indirectly by exhaustion of the energy reserves which a deer normally requires to survive winter. This effect can be particularly pronounced in pregnant does, which may abort the fetuses they are carrying. Deer are especially susceptible when snow crusting supports predators or dogs.

Habitat and Deer Food

The health of deer in winter and beyond is directly tied to habitat quality. **Artificial feeding is no substitute for protecting and maintaining good-quality habitat.**

If you want to help deer, **improving natural range** is preferable to artificial feeding for a variety of reasons. A single operation can give deer more of their natural foods for a number of years. It reduces the need for emergency action. Well-planned habitat projects can maintain favorable year-round conditions for deer and for a variety of other wildlife species. Landowners and other volunteers can help create or maintain the magic mix of food and cover on their properties by considering the following questions: Are there suitable fall or spring foods around? What type of browse is there and how much grows around the deer yards? How much cover is available adjacent to food supplies? To help deer you can manage and encourage the land to grow more of the deer's favourite foods.

What You Can Do

Fall Food. Plant or protect oaks to provide valuable fall food for deer and other wildlife. Prune old apple trees or release them from competing vegetation to provide fruit for deer. In open areas, seed grasses, clovers and other legumes are used. Techniques for enhancing these cool season forage plants are described under spring foods.

Winter Food. Food supplies **close to cover** enable deer to feed without squandering energy and can reduce winter mortality in deer yards. Landowners may wish to plant conventional agricultural crops, such as corn, in clumps or strips next to deer yards. These provide a supplement to natural foods. People may also create natural browse by managing openings in the forest, again adjacent to cover.

Landowners can manage properties to create natural deer food. Photo - P. C. Smith.

Suckers -- shoots emerging from stumps -- often develop when pole-sized trees are cut for firewood. Red maple, sugar maple and poplar are browse species that usually flourish within a year after this cutting. Sprouts may grow so quickly that they need to be cut back every two or three years to keep them within reach of the deer. Openings or patches should be large enough to allow sunlight to reach low growing shrubs or young trees.

Landowners may also plant shrubs to further enhance natural browse. Dogwood and viburnum are typical shrubs readily available from nurseries and provide good browse for deer. Many shrubs also provide berries that attract other wildlife.

Spring Food. Deer seek the early plants of spring in woodlots, forest openings and other clearings such as the edge of farm fields. Excellent spring (and fall) forage can be created by seeding mixtures of clover and grasses in abandoned farm fields, old log landings or logging roads. Winter wheat or rye may be planted for foods both in fall and spring. You may need to prepare or fertilize the site initially before seeding. Cutting or mowing may be necessary to maintain dense herb growth. If possible, manage existing openings rather than create new ones. It is cheaper and maintains habitat for forest-dwelling wildlife.

Feeding Deer

MNR biologists rank feeding into two categories: supplementary and emergency. **There is a difference.**

Emergency Feeding is providing artificial feed to deer during severe winter conditions because natural food is not available (i.e. not present or inaccessible). Emergencies generally occur only at the end of an exceptionally long, severe winter.

Supplementary Feeding is providing artificial food to deer during the winter to supplement natural foods during normal winters before a severe winter condition exists. For example, this could occur where a large herd is yarded in an area where there is little natural food available (e.g. a pine plantation). Supplementary feeding is applied to specific problem areas such as extremely poor winter range.

When deer are fed outside of emergency situations, a number of things may happen. Deer numbers may increase artificially beyond levels the habitat can support in the long run. Supplementary feeding can attract over-sized herds into specific yards. Natural food supplies are quickly depleted, thus reducing the ability of the habitat to support deer in the future. The dangers of overpopulation in this habitat are increased tremendously. Deer become increasingly dependent on artificial feeding. They may experience stress due to overcrowding and fighting behaviour.

Concentrations of deer in feeder areas may also bring them close to highways and vehicles, increasing the risk of roadkills. Also, when deer are concentrated, stress levels and the risk of transmission of disease may be much greater. Persons wishing to feed deer should consider the cost of the feed. A group of 10 deer can consume 18 kilograms (40 pounds) or more of feed per day. It is better not to feed at all than to start feeding, creating dependent deer, and then stop feeding because of cost.

Emergency feeding makes best use of the white-tails' natural survival strategy. It is only done when deer would otherwise not likely make it through the winter
Unlimited supplies of artificial food such as in

supplementary feeding, may interfere with this natural adaptation of deer.

Supplementary feeding may be beneficial in areas where traditional habitat has been degraded. It can be a stop gap measure until habitat improvement occurs.

Placing bags of feed along trails is an effective means of emergency feeding. Photo - P. C. Smith.

Emergency Conservation Measures

Breaking Trails. Deer are reluctant to break new trails when snow is deeper than about 50 centimetres (20 inches). Deer are then confined to well-used trails where food is already scarce. If deer leave the trails in search of browse, they may burn up more energy than they gain from the food.

When snow depths approach 60 to 70 centimetres or crust conditions become severe, new trails may be packed with small bulldozers, farm tractors or snowmobiles. Deer cannot walk on top of crusts the way wolves or snowshoe hares can. New trails give deer easier access between cover and areas of plentiful browse. Emergency trail breaking is easier and more effective when a trail network has been established early in the winter.

Cutting Browse. Buds or branch tips may become scarce because of a local overabundance of deer or because branches grow beyond reach. In emergency situations, crews armed with handsaws, chainsaws or axes can provide more browse by cutting limbs or young trees of desirable food species. Trees that double as conifer cover should not be cut for browse. Cooperating loggers help by leaving tops and limbs from logging operations.

Emergency Feeding. In late winter, if the winter severity index and conservation concerns indicate a need, MNR staff may prescribe emergency feeding as a last resort. A high-protein diet supplement is used. Suitable foods are deer "pellets," pure oats, a 1:4 corn/oats mixture or a 1:1 corn/oats mixture. These are available from local feed mills and agricultural supply stores. Plan on providing up to 1kg. of food per deer per day (1kg equals 2.2 lbs).

MNR biologists are extremely cautious about other emergency feed types. Alfalfa or hay are high in a type of fibre that starving deer cannot digest. Deer fed this material throughout the winter have adapted to the food type. *But a starving deer that gorges on alfalfa or hay may be doomed to continued starvation or death.*

The fibre type in pellets and grain avoid this problem.

Pure corn, barley or wheat is too high in starch. A starch overload creates ideal conditions for bacteria to grow in the digestive tract. With the wrong foods, at the wrong time, deer have been known to die with a full stomach.

Bags are a good means of delivering emergency food. They are easy to handle and keep food from getting wet or sinking into the snow on warm sunny days. Bags can be deposited along snowmobile trails prepared before the end of winter. Early preparation of trails might even provide deer with greater access to natural foods and reduce the need for emergency operations.

Bags or piles of mixed corn and oats should be gradually introduced (just as farmers do for livestock) over a 7 to 14 day period, especially when using concentrated cereal diets. Bags have a natural delay in acceptance because of their appearance to deer, an advantage in minimizing overeating.

A method developed by the Wildlife Winter Feeding Program Inc. for supplementary feeding, uses a handful of mixed corn and oats set on a handful of alfalfa. The quantity is gradually increased over time to three or four handfuls. They place separate piles at the rate of one pile per deer per day.

When hoppers or troughs are used to feed deer, a small number of aggressive deer may dominate the feeders. Spreading around a number of small hoppers works best. Once emergency feeding begins, it should continue until deer leave the yard or have access to new high quality food.

Deer Conservation

The Ministry of Natural Resources aims to conserve populations of wildlife such as deer at levels that the natural habitat can support. The Ministry welcomes the assistance of landowners and conservation groups during emergency situations. Volunteers have devoted many hours to emergency feeding, cutting browse and breaking trails.

Wildlife managers are working with landowners and forest managers to maintain healthy productive deer yards. You too can help by managing your property for natural habitat, by not feeding deer unless they really need it, and by working with the Ministry of Natural Resources during emergency situations.

For more detailed information or a copy of **Guidelines for Winter Feeding of Deer in Ontario** contact the Ministry of Natural Resources. You may also contact The Ontario Federation of Anglers and Hunters at P.O. Box 2800, Peterborough, Ontario, K9J 8L5, about the Deer Save Fund and program at 1-705-748-6324 (e-mail ofah@oncomdis.on.ca) or The Wildlife Winter Feeding Program Inc. at P.O. Box 5332, Huntsville, Ontario, P1H 2K7 about its activities at (705) 789-5456.

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